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# PHILOSOPHICAL TRANSACTIONS.

*Munday Septemb. 9. 1666.*

## The Contents.

*Observations made in several places (at London, Madrid and Paris,) of the late Eclipse of the Sun, which hapned June 22. 1666. Some Enquiries and Directions, concerning Tides, proposed by Dr. Wallis. Considerations and Enquiries touching the same Argument, suggested by Sir Robert Moray. An Account of several Books lately publisht: Vid. 1. Johannis Hevelii Descriptio Cometæ, A. 1665. exorti; una cum Mantissa Prodromi Cometici. 2. Isaacus Vossius de Nili & aliorum Fluminum Origine. 3. Le Discernement du Corps & de l'Ame, par Monsieur de Cordemoy.*

*Observations made in several places, Of the late Eclipse of the Sun, which hapned on the 22 of June, 1666.*

**T**He Observations that were made at *London* by Mr. *Willughby*, Dr. *Pope*, Mr. *Hook*, and Mr. *Philips*, are these:

		h.
	1 diam. —————— at 6. 00	5 dig. —————— at 7. 06
	4 digits —————— at 6. 07	4 dig. —————— at 7. 13
It was	5. dig. —————— at 6. 13	3 dig. —————— at 7. 20
dark-	6 dig. —————— at 6. 21	2 dig. —————— at 7. 26
ned.	7 dig. —————— at 6. 39½	1 dig. —————— at 7. 32
	6 dig. —————— at 6. 57	0 dig. —————— at 7. 37

Its Duration hence appears to have been one hour and 54 m. Its greatest Obscrrity somewhat more than 7. digits. About the middle, between the Perpendicular and Westward Horizontal Radius of the Sun, viewing it through Mr Boyle's 6c. foot-Telescope, there was perceived a little of the Limb of the Moon without the Diske of the Sun: which seemed to some of the Observers to come from some shining Atmosphere about the Body either of the Sun or Moon.

They affirm to have observ'd the Figure of this Eclipse, and measured the Digits

*Digits*, by casting the *Figure* through a 5 foot *Telescope*, on an extended paper, fixt at a certain distance from the Eye-glasse, and having a round figure; all whose *Diameters* were divided, by 6 *Concentrick Circles*, into 12 *Digits*.

The Observations made at *Madrid* by a Noble Member of the *Royal Society*, His Excellence the Earle of *Sandwich*, as they were sent to the Right Honourable, the Lord Vice-Count *Brouncker*, are these;

The Eclipse began at *Madrid* about 5 of the Clock in the morning, at 5 h. 35'. the Suns Altitude was 6 deg. 55'.

The Middle of it was at 6 h. 2'; the Suns Altitude, 15. deg. 5'.

The End was exactly at 7 h. 5'; the Suns Altitude, 25. deg. 24'.

The Duration, 2 h. 4'.

37. Parts of the Suns diameter remained light.

63. Parts of the same were darkened.

The Observations made at *Paris* by Monsieur *Payen*, assisted by several Astronomers, as they were printed in *French*, and addressed to Monsieur de *Montmor*, are these;

The Eclipse began there, at 5 h. 44'. 52". mane. It ended at 7 h. 43'. 6". So that its Whole Duration was 1 h. 58'. 14". The greatest Obscuration they assign to have been 7. dig. 50. m. but they adde, that it seem'd to have been greater by 3 minuts; which M. *Payen* imputes to a particular motion of *Liberation* of the Suns Globe, which entertain'd that Luminary in the same *Phasis* for the space of 8. min. and some seconds, as if it had been stopped in the midst of its Course; rather than to a tremulous Motion of the *Atmosphere*, as *Scheiner* would have it.

They intimate that they took the time of each *Phasis* from half digit to half digit, as well by a *Pendulum*, as by the *Altitudes* of the *Suns Center* above the *Horizon*, corrected by the *Verticall Paralaxes* and *Aestivall Refractions*, by which they judged, that though the Time by the *Pendulum* may be sufficient for *Mechanicall Operations*, yet 'tis not exact enough for establishing the *Grounds of true Astronomy*.

They further conceive that the apparent *Diameters* were almost equal; seeing that in the *Phasis* of 6. *Digits*, the *Circumference* of the *Moons disk* passed through the *Center* of that of the *Sun*, so as that two Lines drawn through the two *Horns* of the *Sun*, made with the *Common Semi-diameter* two *Equilateral Triangles*.

Next, they affirm, That there was so great a Variation in the *Parallaxes*, by reason as well of the *Refractions* of the *Air*, which environs the *Earth*, as of the Alteration of the *Air*, which encompasses the *Moon*, that the *Horns* of the *Sun*, there formed by the Shaddow of the *Moon*, appeared in all kinds of *Figures*; Sometimes inclined to the *Vertical*, sometimes *Perpendicular* to the *Horizon*, and at last *Parallel*; the *Convex* part respecting the *Heaven*, and the *Concave*, the *Horizon*. By the crossing (so they go on) of the *Horns*

*Moons with the Angles of Inclination*, it will be easie to those, that have exactly observed them, and that are skill'd in the higher Astronomical Calculations, to compute the true Place of the Moon in her Orbite, that so it may be compared with that of the Tables, and with that, which has been observ'd in other places, for the more precise determinating of the Difference of Meridians (that being the way esteem'd by Kepler the most certain) and for making a good Judgment of the defect or exactnesse of the Celestial Tables.

Then they observe, That the Beginning and the Middle of this Eclipse hapned to be in the North Eastern Hemisphere, and the End, in the South-Eastern. The first Contact (as 'twere) of the two Disks was observ'd in the Superior Limb of the Sun: Disk in respect to the Vertical Line, and in the Inferior in respect to the Eclipick: But the Middle, and the End were seen in the Superior Limb, in respect both to the Vertical and the Eclipick: And (what to this Author seems extraordinary) both the Beginning and the End of this Eclipse hapned to be in the Oriental part of the Suns Disk.

Lastly, they take notice, that by their Observations it appears, that there is but little exactness in all the Astronomical Tables, predicting the Quantity, Beginning and Duration of this Eclipse; Those of Lansbergius importing, That the Obscuration should be of 1 c. dig. 48'; those of Ricciolo, of 9. dig. 1'; and those of Kepler, of 7. dig. 30'. 16": Again, that the Duration should be of 2 h. 2'. Lastly, The Beginning did anticipate the Ricciolan Tables by 5. minuts; the End by 23; and the Middle, almost by 11. In the mean time the Author notes, that the Rudolphin Tables come nearest to the Truth; and withal assures the Reader of the goodness of the Instruments employed in his Observations, and of the singular care, he, together with his skilful Assistants, took in making them.

*Some Inquiries and Directions concerning Tides, proposed by Dr. Wallis, for the proving or disproving of his lately publish'd Discourse concerning them.*

The Inquisitive Dr. *Wallis*, having in his lately printed *Hypothesis of Tides* intimated, that he had reason to believe, that the *Annual Spring-tides* happen to be rather about the beginnings of Febr. and Nov. than the two *Aquinores*, doth in a late Letter to the Publisher, written from Oxford in Aug. last, desire, *Sea*, some understanding Persons at London, or Greenwich, but rather nearer the *Sea* or upon the Sea-shore, would make particular Observation of all the *Spring-Tides* (*New-Moon* and *Full-Moon*) between this and the End of November; and take account of the *Hour*, and of the *Perpendicular height*: that we may see, whether those in September, or those of November be highest: And if it were not amiss, the *Low waters* were observed too. Which may be easily done by a mark made upon any standing Post in the Water, by any